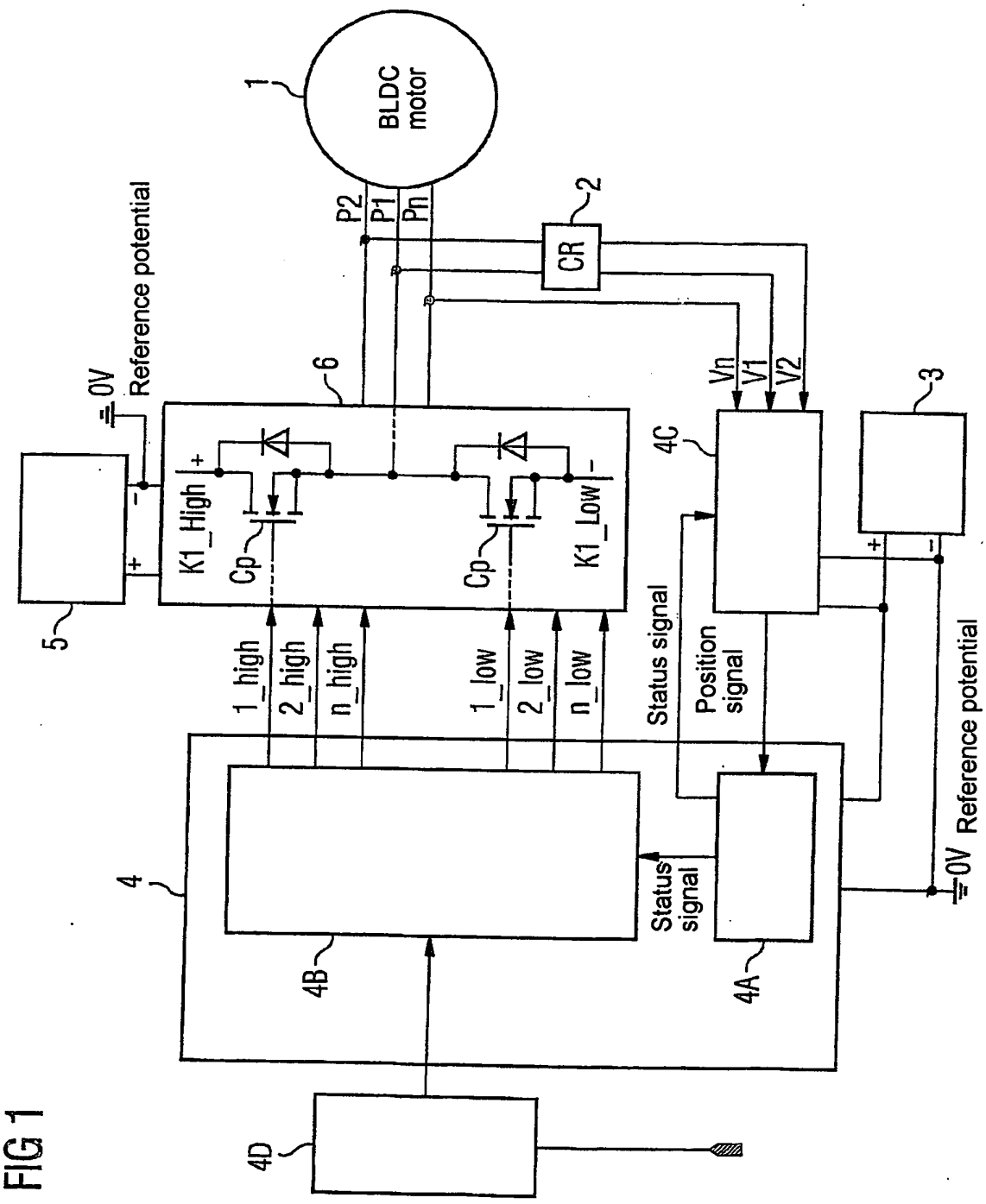

1
BLDC motor
P2
P1
Pn
2
CR
6
0V
Reference potential
Vn
V1
V2
3
4C
K1_High
Cp
Cp
K1_Low
5
1_high
2_high
n_high
1_low
2_low
n_low
Status signal
Position signal
4
4B
4A
Status signal
0V
Reference potential
4D

FIG 1

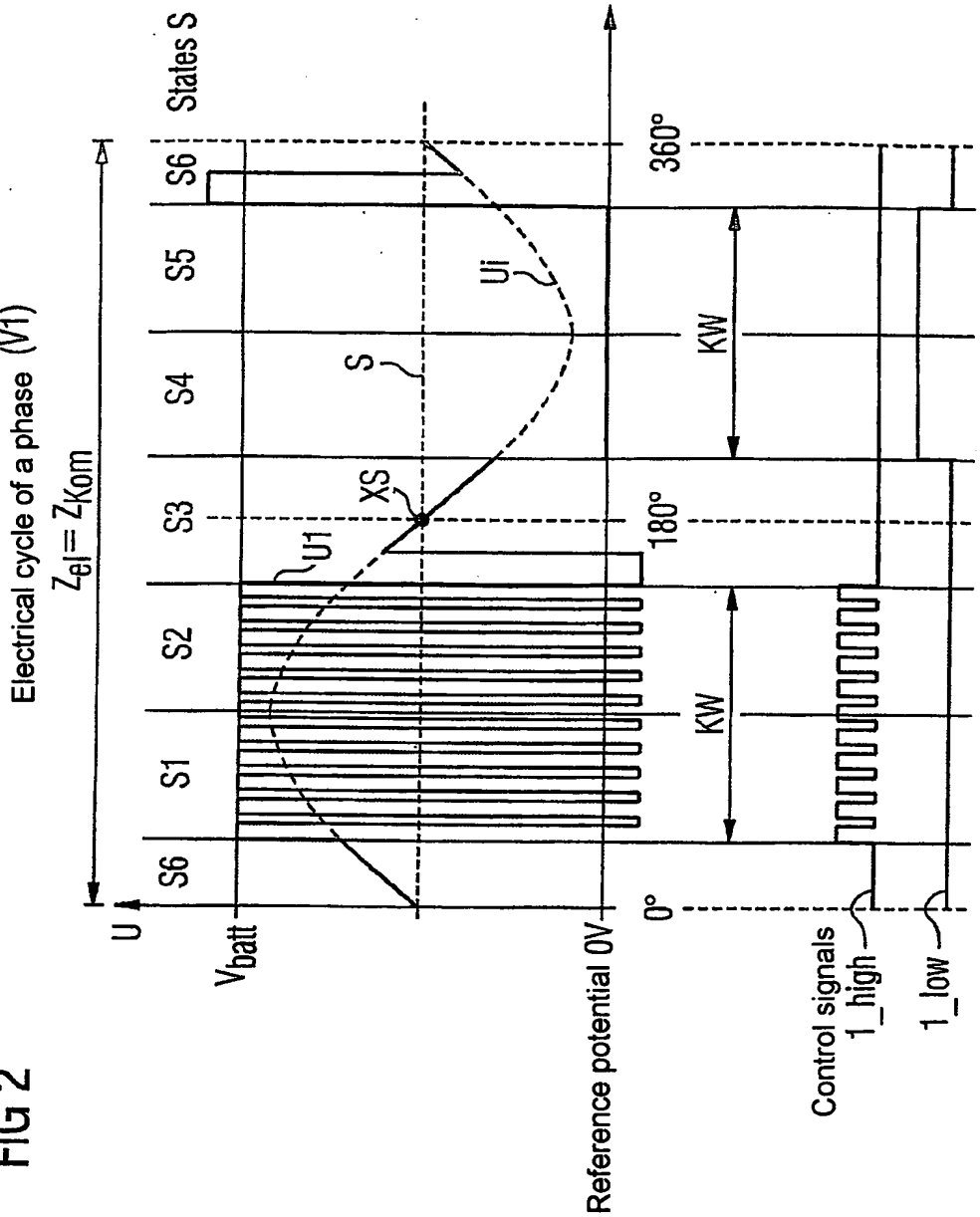

States S
S6
S5
S4
S3
S2
S1
S6
Ui
S
XS
U1
KW
KW
360°
180°
0°
Electrical cycle of a phase (V1)
$Z_{el} = Z_{Kom}$
U
V_{batt}
Reference potential 0V
Control signals
1_high
1_low

FIG 2

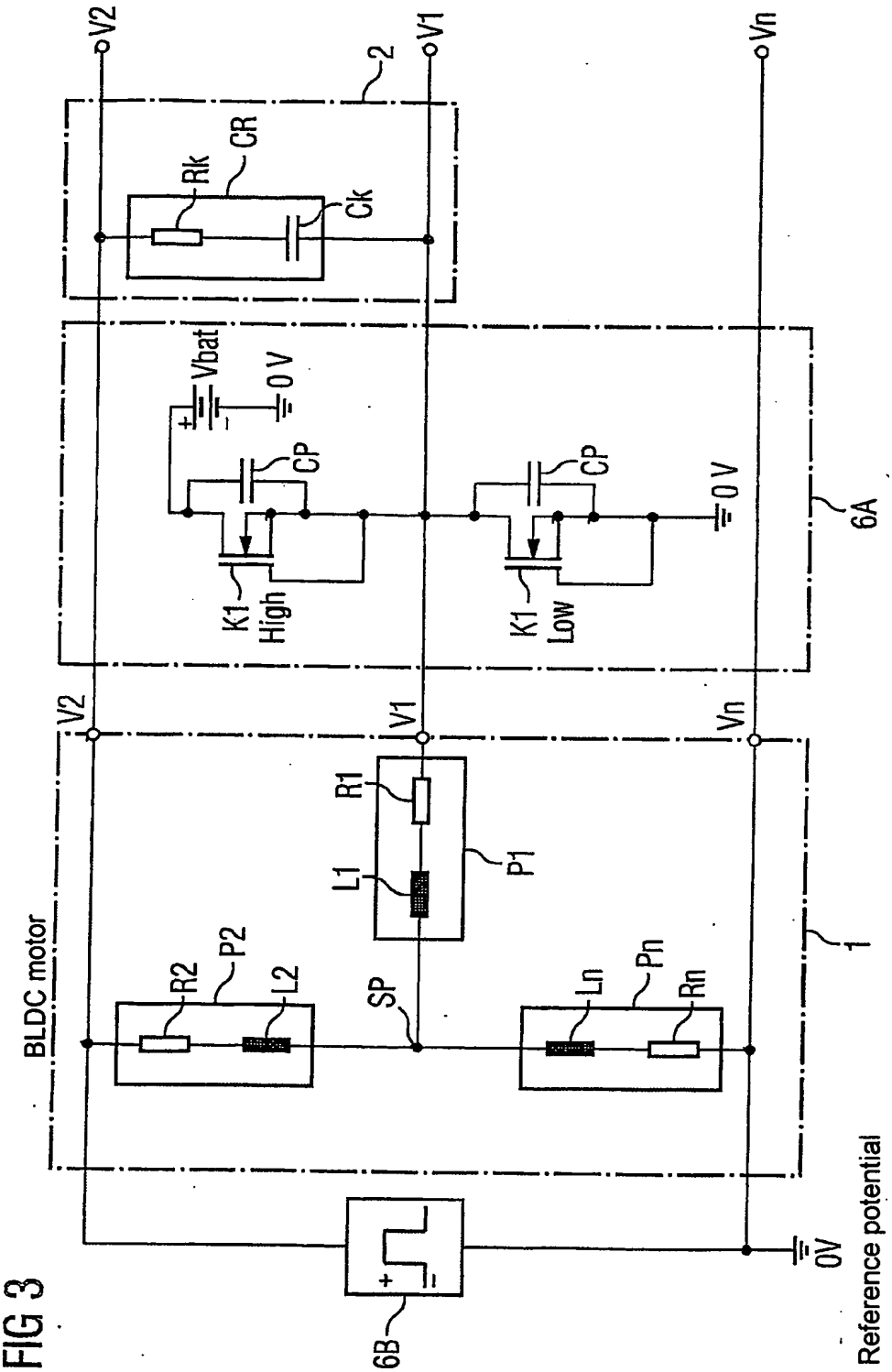
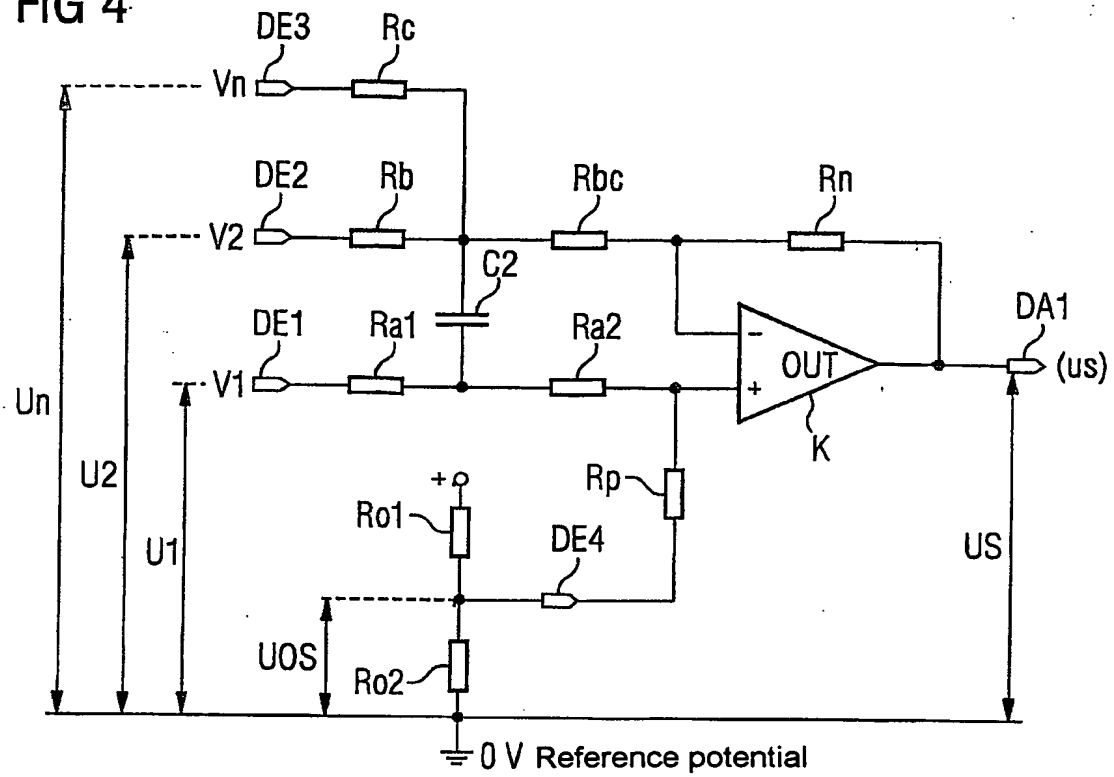

V2
V1
Vn
2
Rk
CR
Ck
Vbat
0 V
CP
CP
0 V
6A
K1
High
K1
Low
V2
V1
Vn
R1
L1
P1
BLDC motor
R2
P2
L2
SP
Ln
Pn
Rn
1
0V
6B
Reference potential

FIG 3

FIG 4



Half-wave differential amplifier unit with filter function

FIG 5

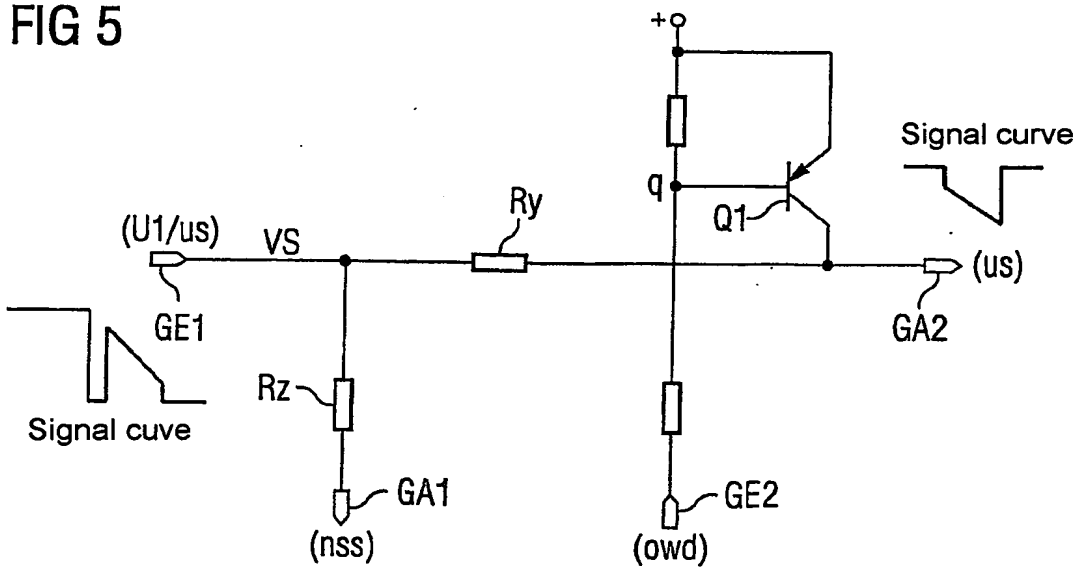


FIG 6

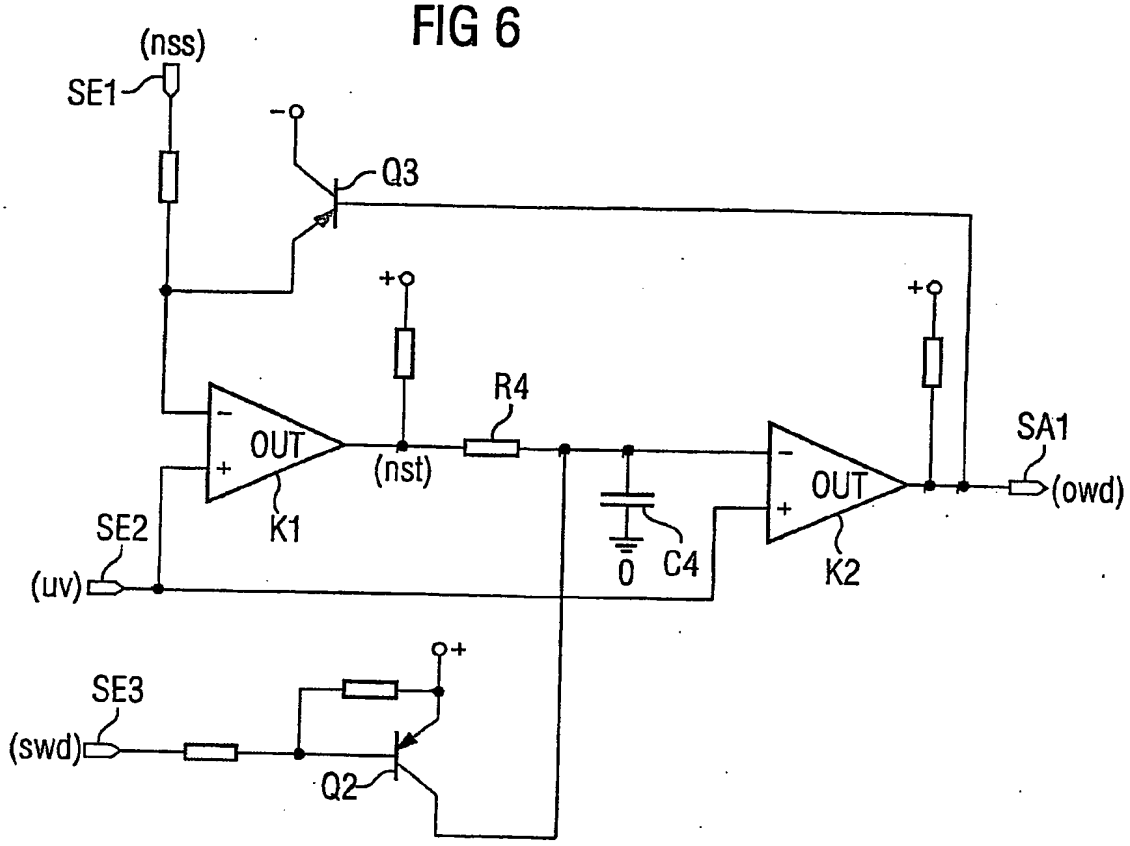

(nss)
SE1
Q3
R4
OUT
(nst)
K1
SE2
(uv)
C4
OUT
K2
SA1
(owd)
SE3
(swd)
Q2

FIG 7A

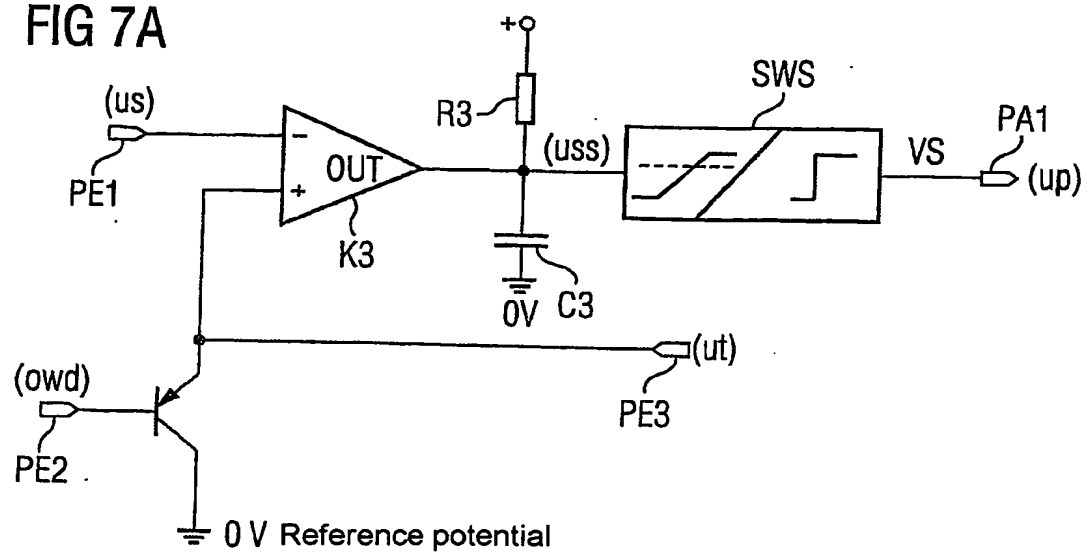

(us)
PE1
OUT
K3
R3
(uss)
SWS
VS
PA1
(up)
0V
C3
(ut)
PE3
(owd)
PE2
0 V Reference potential

FIG 7B

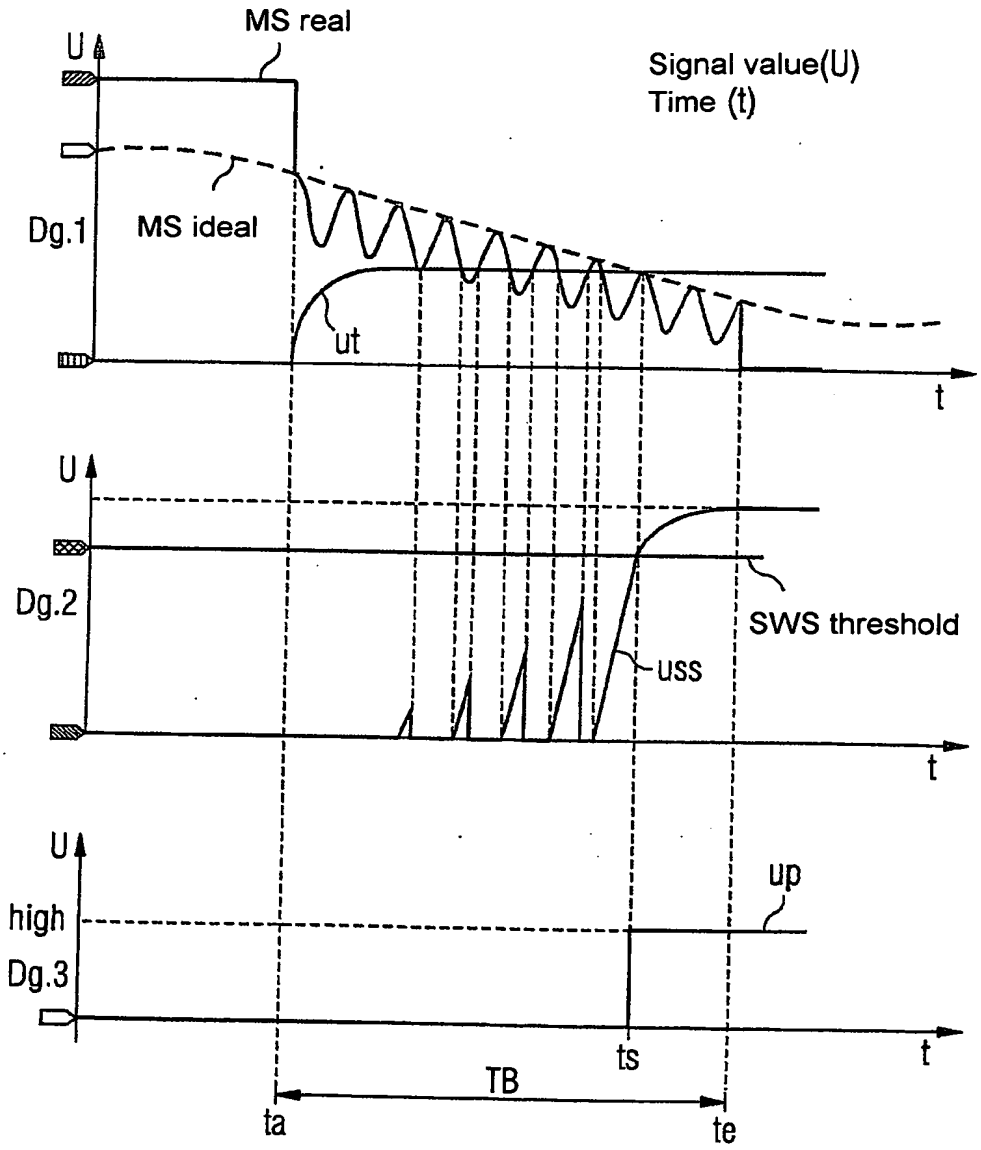

MS real
U
Signal value(U)
Time (t)
Dg.1
MS ideal
ut
t
U
Dg.2
SWS threshold
uss
t
U
up
high
Dg.3
ts
t
TB
ta
te

FIG 8

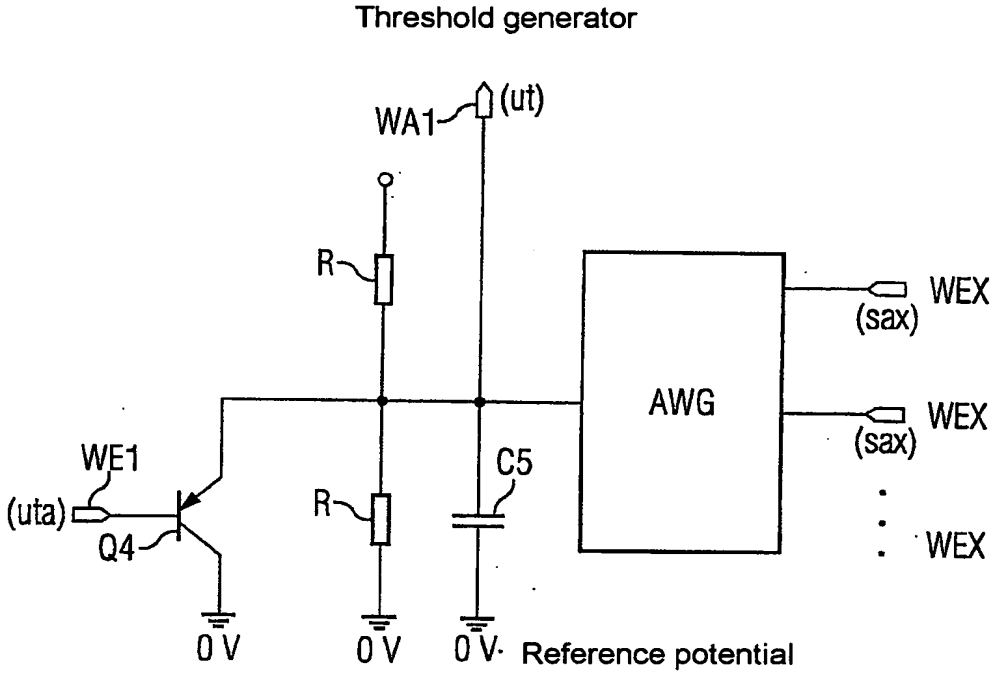
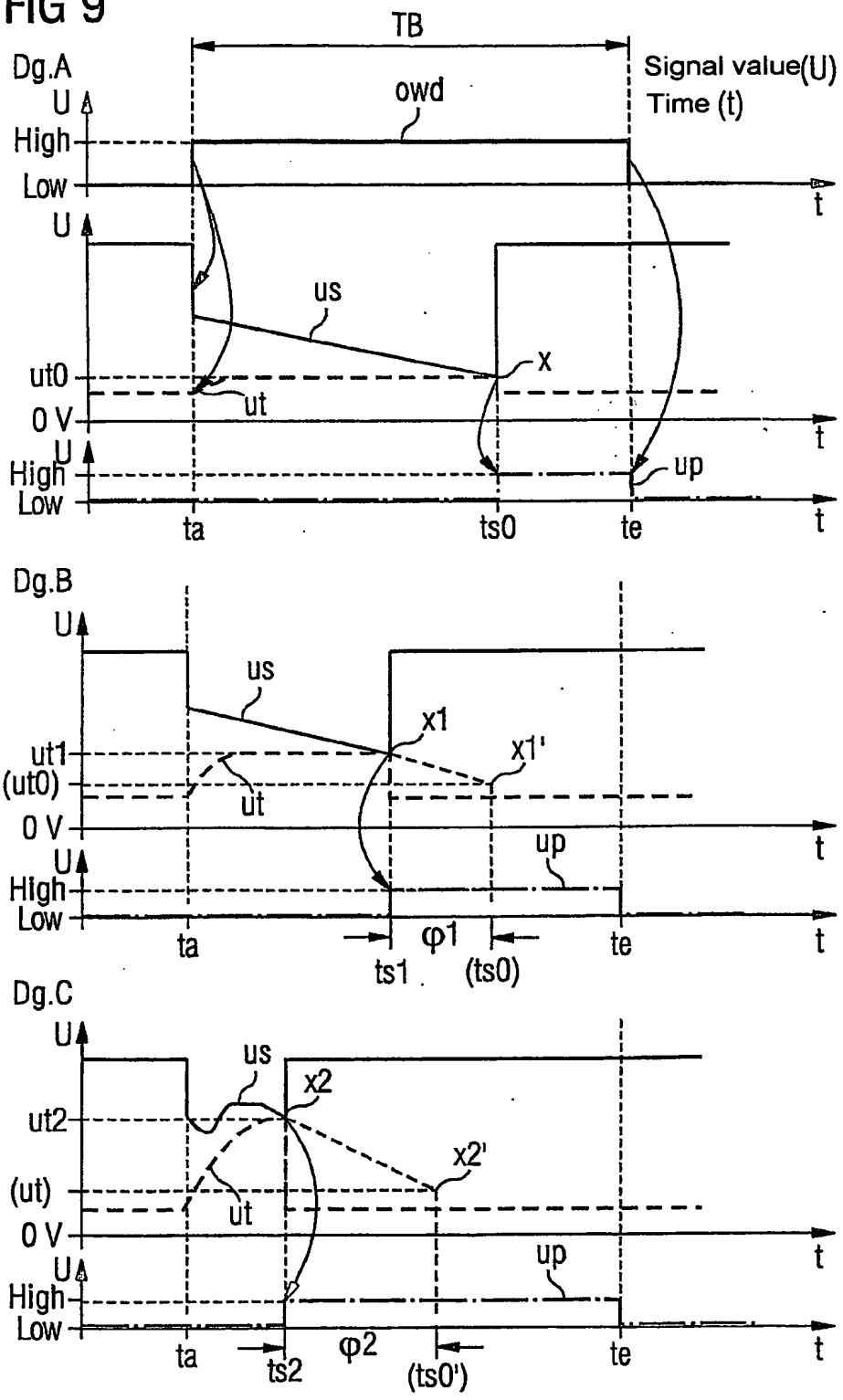

Threshold generator
WA1
(ut)
R
WEX
(sax)
AWG
WEX
(sax)
WE1
C5
(uta)
R
Q4
WEX
0 V
0 V
0 V
Reference potential

FIG 9


TB
Dg.A
U
High
Low
owd
Signal value(U)
Time (t)
t
us
x
ut0
ut
0 V
up
ta
ts0
te
Dg.B
x1
x1'
ut1
(ut0)
φ1
ts1
(ts0)
Dg.C
x2
x2'
ut2
(ut)
φ2
ts2
(ts0')

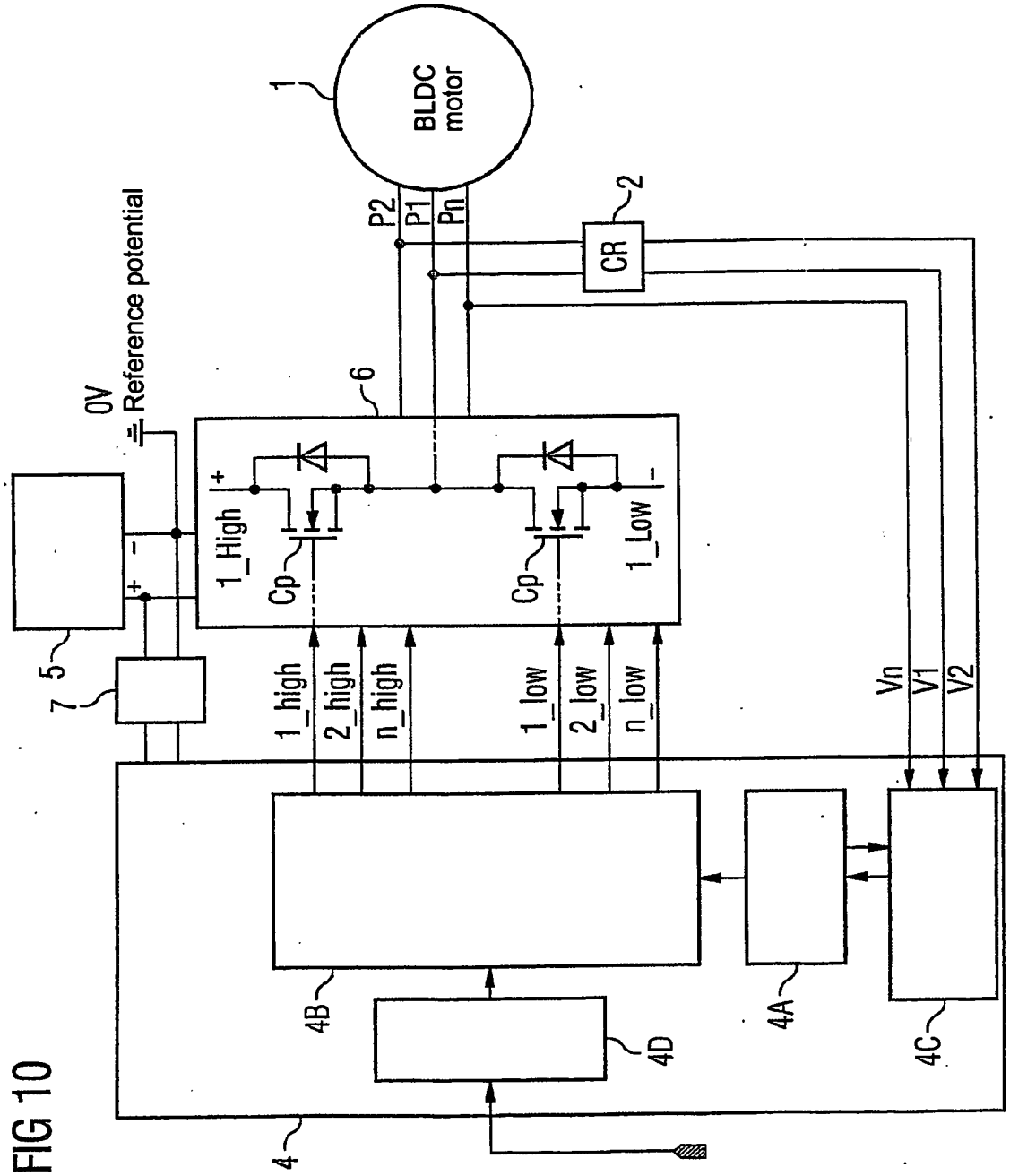

1
BLDC motor
P2
P1
Pn
2
CR
0V
Reference potential
6
1_High
Cp
Cp
1_Low
5
7
1_high
2_high
n_high
1_low
2_low
n_low
Vn
V1
V2
4B
4D
4A
4C
4

FIG 10